

WETLAND MITIGATION SITE MONITORING REPORT

FAP 322 (US 51) Jackson County

Introduction

This report details monitoring of the wetland mitigation site created to compensate for impacts associated with FAP 322 (US 51) in Jackson County. The site consists of approximately 2.4 ha (6.0 ac) of wetland creation. The wetland creation site is located south of DeSoto, IL, northwest of the intersection of US 51 and Big Muddy River. The legal location is SW/4, SW/4, SW/4, Section 33, T. 8 S., R. 1 W. The project area lies within the United States Geological Survey Mississippi River hydrologic unit 07140106, Big Muddy River. No historical information was provided despite repeated requests, but the site was probably completed and trees planted sometime between spring 2000 and spring 2002. On-site monitoring was conducted on August 19, 2004.

This report discusses the goals, objectives, and performance criteria for the mitigation project, the methods used for monitoring the site, monitoring results, and discussion and recommendations based on the results. Methods and results are discussed by performance criteria for each goal.

Goals, Objectives, and Performance Standards

Goals, objectives, and performance standards follow those specified in the monitoring plan (J. Klamm, IDOT District 9 Environmental Coordinator, 2002) developed for this site. Performance criteria are based on those specified in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), *Illinois Wetland Restoration and Creation Guide* (Admiraal et al., 1997), and in *Guidelines for Developing Mitigation Proposals* (USACE 1993). Each goal should be attained by the end of the 5-year monitoring period. Goals, objectives, and performance criteria are listed below.

Project goal 1: The created wetland community should be a jurisdictional wetland as defined by current federal standards.

Objective: The created wetland should compensate for the loss of 2.4 ha (6.0 ac) of scrub-shrub wetland at a 1:1 ratio.

Performance criteria:

- a. Predominance of hydrophytic vegetation: More than 50% of the dominant plant species must be hydrophytic.
- b. Presence of wetland hydrology: The area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season.
- c. Occurrence of hydric soils: Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at the site.

Project goal 2: The created wetland plant community should meet standards for planted species survival and floristic composition.

Objectives: Planting seedling trees and a wetland grass mixture will create a wet meadow/forested wetland. Other herbaceous vegetation will be allowed to colonize the site naturally.

Performance criteria:

- a. Planted species survivorship: At least 80% of the planted trees and shrubs should be established and living.
- b. Native species composition: At least 70% of the plant species present should be non-weedy, native, perennial and annual species.
- c. Dominance of vegetation: None of the dominant plant species may be non-native or weedy species.

Methods

Project goal 1

a. Predominance of hydrophytic vegetation

The method for determining dominant vegetation at a wetland site is described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and further explained in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989). It is based on aerial coverage estimates for individual plant species. Each of the dominant plant species is then assigned its wetland indicator status rating (Reed 1988). Any plant rated facultative or wetter, i.e., FAC, FAC+, FACW, and OBL, is considered a hydrophyte. A predominance of wetland vegetation in the plant community exists if more than 50% of the dominant species present are hydrophytic. Since the survival of planted hydrophytic trees and shrubs on non-wetlands (i.e. yards) is well documented, these species were excluded from calculations of percentage of dominant hydrophytic species.

b. Presence of wetland hydrology

Illinois State Geological Survey (ISGS) personnel installed eight soil-zone monitoring wells, a stage gauge, and an RDS data logger at the site in the autumn of 2002 (Fucciolo, et al., 2003). Locations for these sites can be found in the ISGS annual report for 2003 (Fucciolo, et al., 2003). Water-level data was collected beginning in October, 2002.

c. Occurrence of hydric soils

The soil was sampled in order to monitor hydric soil development. Soil profile morphology including horizon color, texture, and structure was described at various points throughout the site. Additionally, the presence, type, size, and abundance of redoximorphic features were noted. Hydric soils may develop slowly, and characteristics may not be apparent during the first several years after project construction. In the absence of hydric soil indicators at the end of the five-year monitoring period, hydrologic data could be used as corroborative evidence that conditions favorable for hydric soil formation persist at the site.

Project goal 2

a. Planted species survivorship

In order to create floodplain forest, tree saplings were planted at the compensation site. According to the program development memorandum for this project (Karl Bartelsmeyer, IDOT District Engineer, memo to Steve Hamer, April 5, 2000), the following number of trees were to be planted at the site:

Table 1. Tree species planted in the created wetland (Planting date unknown).

| Species | Common Name | Number |
|--------------------------------|-----------------|--------|
| <i>Betula nigra</i> | River birch | 1000 |
| <i>Fraxinus pennsylvanica</i> | Green ash | 1000 |
| <i>Liquidambar styraciflua</i> | Sweetgum | 1000 |
| <i>Platanus occidentalis</i> | Sycamore | 1000 |
| <i>Quercus bicolor</i> | Swamp white oak | 1000 |
| <i>Quercus palustris</i> | Pin oak | 1000 |
| TOTAL | | 6000 |

Survivorship and density of planted trees was determined through a census of the created wetland. All live trees and shrubs were counted. Dead or cut-off trees were not counted due to the excessive numbers and the difficulty of identification by species.

Tree survival was calculated as a percentage of the number of stems reported to have been planted:
 $100 \times (\text{Total number of live planted stems counted} / \text{total number of planted stems reported})$.

b. Native Species Composition

A complete list of plant species present was compiled. This was used to determine the number and percentage of species present that are non-weedy, native, perennials and annuals.

In addition, the Floristic Quality Assessment (Taft et al. 1997) was applied to the plant community at the site to evaluate floristic quality and nativity. The assessment methodology is used to identify natural areas and facilitate floristic comparisons among sites. This technique is part of the procedure for the long-term monitoring of natural areas and the monitoring of restored or created wetlands (Swink and Wilhelm 1994). The basis of the method is that each native plant species is assigned a conservatism coefficient (C) ranging from 0 to 10. Individual conservatism coefficients are ranks of species behavior and reflect the committee's (Taft et al. 1997) confidence level for a taxon's correspondence to anthropogenic disturbances. Coefficient values range from 0 to 10, with all adventive species given a coefficient of 0. Plant species assigned 0 have low affinities for natural areas, whereas those assigned 10 have very high affinities. When a complete species list is assembled for a wetland site, the overall average conservatism coefficient (\bar{C}) and a site floristic quality index (FQI) can be calculated. The \bar{C} is calculated by summing the coefficients of conservatism (ΣC) and dividing by the total number of native species (N). The FQI is then calculated by dividing the ΣC by the square root of N. These values provide a measure of site floristic quality. Floristic quality index (FQI) values less than 5 indicate that the area is extremely weedy or in an early successional stage (Swink and Wilhelm 1994). FQI values between 20 and 35 ($\bar{C} = 3.0$) indicate that the area has evidence of native character and can be considered a botanical asset. FQI values between 35 and 50 ($\bar{C} = 3.5$) indicate that the area has significant native character.

c. Dominance of vegetation

Plant species dominance was determined as in project goal 1, a. Predominance of hydrophytic vegetation. The method for determining dominant vegetation at a wetland site is described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and further explained in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989).

In addition, four permanent photography stations were established so that photographs could be used to document changes in plant community structure and composition. The photo stations were located essentially in the four corners of the site and will be indicated on an aerial photograph when received.

Results

Project goal 1

a. Predominance of hydrophytic vegetation

Dominant plant species for the mitigation site in 2004 are shown in Table 2. Four of the five dominant species are rated OBL, FACW, FAC+, or FAC and are hydrophytic. The fifth species (*Lespedeza cuneata*) is not assigned a wetland indicator status.

Table 2. Dominant plant species by stratum and wetland indicator status.

| Dominant Plant Species | Stratum | Indicator Status |
|-----------------------------|---------|------------------|
| <i>Echinochloa muricata</i> | Herb | OBL |
| <i>Iva annua</i> | Herb | FAC |
| <i>Leersia oryzoides</i> | Herb | OBL |
| <i>Lespedeza cuneata</i> | Herb | None |
| <i>Panicum virgatum</i> | Herb | FAC+ |

b. Presence of wetland hydrology

Last year the ISGS estimated that "the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2004 is 5.4 ac (2.2 ha)" (Fig. 1, next page)(Fucciolo, et al 2003). This year, a drier than average year, only 1.2 ha (2.9 ac) satisfied the wetland hydrology criteria (Fucciolo, et al 2004). More information is available in the *US 51, Jackson County, DeSoto Wetland Compensation Site* report (Fucciolo, et al 2004).

Based on field evidence observed during our on-site visits, the majority of this site exhibits wetland drainage patterns, water stained leaves, algal mats, and oxidized root channels, and therefore may possess wetland hydrology.

c. Occurrence of hydric soils

Soils examined at the site were found to be only moderately disturbed. Excavation has been done and the sites lack an undisturbed A horizon. The existing soil at much of the site is a combination of the former A and E horizons. Topsoil was not replaced after excavation. Even though the soils are disturbed, hydric soil indicators are present. Table 3 on page 7 presents a soil description of a typical pedon located within this site:

Table 3. Description of the soils at the site.

| Depth | Matrix Color | Concentrations | Depletions | Texture | Structure |
|--------------------------|--------------|------------------------|------------|-----------|-----------------------------------|
| 0-15 cm (0-6 in) | 10YR 4/2 | 7.5YR 5/6 | None | Silt loam | Medium granular |
| 15-38 cm (6-15 in) | 10YR 5/2 | 7.5YR 5/6 and 10YR 5/6 | None | Silt loam | Medium granular and weak platy |
| 38-66+ cm (15-26+ in) | 10YR 5/2 | 7.5YR 5/6 and 10YR 5/6 | None | Silt loam | Weak granular and weak platy |

The majority of this site satisfies the wetland criteria; therefore, we believe this site is a wetland. Current wetland acreage at this site is estimated to be 5.4 ac (2.2 ha), corresponding to that area determined by the ISGS in 2003 to possess wetland hydrology. This estimate will be refined in future years as more hydrologic data is gathered.

Project goal 2

a. Planted species survivorship

Table 4 shows the results of the census. There were serious discrepancies between the numbers of trees reported as planted and the number of live trees counted. Table 4 also shows the percent survival for the trees. These figures were calculated both by species and overall for all species in the entire site. Fewer than 35% of the trees reported planted were counted. While these numbers are up from last year, these data show that this site cannot meet the criteria for planted species survivorship without remedial action being taken. However, natural regeneration of a fairly diverse assemblage of tree species is amply abundant within the project area. Natural regeneration is proceeding so well at this site that it is becoming difficult to determine with any certainty which trees were planted and which were not. This is complicated by the fact that in 2002 this site flooded, and it appears that many of the planted trees that were not counted as live that year have now resprouted from the ground and are indeed growing.

Table 4. Number of trees counted and percent tree survival (by species).

| Species | Common Name | Number live | % of reported |
|--------------------------------|-----------------|-------------|---------------|
| <i>Betula nigra</i> | River birch | 207 | 20.9 |
| <i>Carya illinoensis</i> | Pecan | 2 | NA |
| <i>Fraxinus pennsylvanica</i> | Green ash | 682 | 68.2 |
| <i>Liquidambar styraciflua</i> | Sweetgum | 118 | 11.8 |
| <i>Platanus occidentalis</i> | Sycamore | 505 | 50.5 |
| <i>Quercus bicolor</i> | Swamp white oak | 22 | 2.2 |
| <i>Quercus lyrata</i> | Overcup oak | 45 | NA |
| <i>Quercus palustris</i> | Pin oak | 483 | 48.3 |
| TOTAL | | 2064 | 34.4 |

b. Native species composition

This site has only 62% non-weedy, native, annual and perennial species. Therefore, it does not meet the requirement for native species composition (70%). It is normal, however, for a site to begin very weedy and develop more native character over time, and this site is already close to the project goals for native species composition. The native species composition at this site has increased in each year of monitoring, which bodes well for the future.

Two FQI values were calculated for this site from the species lists included in Appendix A. The first FQI value is calculated from only species which became established on the site naturally; the second

FQI value includes the planted trees. The FQI value is 22.6 with a \bar{c} value of 2.7 when only naturally established vegetation is considered, and 24.2 and 2.8 respectively when the planted trees are included. Therefore this site is of good natural quality.

c. Dominance of vegetation

This site does not meet the performance criteria for dominance of vegetation. Four of the dominant species (Table 2) are native; however, two of these four species are considered weedy. *Echinochloa muricata* and *Iva annua* are weedy or undesirable, while *Leersia oryzoides* and *Panicum virgatum* are not. The fifth species at this site, *Lespedeza cuneata*, is non-native and weedy.

Photography stations were established in each corner of the site, with number 1 in the southeast, number 2 in the southwest, number 3 in the northeast, and number 4 in the northwest corner. Photographs were taken from the permanent photography stations established this year and are in Appendix B of this report.

Discussion

After three monitoring seasons, this site shows progress toward wet meadow/forested wetland establishment. As the vegetative succession proceeds, this site will most likely comply with project goals, objectives, and performance standards by the end of the monitoring period with the exception of planted tree survival. Even if the standards are not met, we feel this site has very good potential for the eventual creation of wet meadow/forested wetland.

The vegetation is hydrophytic and nearly meets the dominance criteria for native non-weedy species. One problem we noticed this year is the invasion of the aggressive exotic *Lespedeza cuneata*. This plant may need to be controlled for this site to be successful. However, this species is not likely to remain dominant after the trees at this site close the canopy in the future. The planted tree seedlings experienced excessive mortality and the site will need to be replanted in order to meet the planted species performance criteria. However, the seemingly excellent natural regeneration of this site indicates that planted tree survivorship may not be of paramount importance. Four of the planted species (*Fraxinus pennsylvanica*, *Liquidambar styraciflua*, *Platanus occidentalis*, and *Quercus palustris*) have sufficient natural regeneration to compensate for the mortality of the original plantings. There are still a large number of species at each site that have very low coefficients of conservatism (C). This is common on disturbed and early successional sites and is not a cause for concern at this time. It is likely that as succession progresses, more conservative species will become established on the site; this can be seen in the steady increase of both mean c and FQI values over the monitoring period (Table 5).

Table 5.

| Year | Without planted species | | With planted species | |
|------|-------------------------|-----------|----------------------|-----------|
| | FQI | \bar{c} | FQI | \bar{c} |
| 2002 | 15.3 | 2.1 | 16.5 | 2.2 |
| 2003 | 20.7 | 2.5 | 22.9 | 2.7 |
| 2004 | 22.6 | 2.7 | 24.2 | 2.8 |

Currently, the primary concerns for this site are establishing non-weedy, native dominant vegetation and adequate tree density. This site already has hydric soil characteristics, hydrophytic vegetation, and some areas of wetland hydrology. An estimate of current wetland acreage is 5.4 ac (2.2 ha), corresponding to that area determined by the ISGS to possess wetland hydrology in 2003. A further estimate of jurisdictional wetland acreage will be made during the 2005 monitoring visit using a GPS system.

Literature Cited

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ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 1 of 5)

Field Investigators: Wiesbrook and Busemeyer **Date:** August 19, 2004
Project Name: FAP 322 (US 51) **Section No.:** 2B-3
State: Illinois **County:** Jackson **Applicant:** IDOT Dist. 9
Area Name: Wet meadow
Legal Description: SW/4, SW/4, SW/4, Section 33, T. 8 S., R. 1 W
Location: This wetland occupies nearly the entire mitigation monitoring site.

Do normal environmental conditions exist at this area? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

| Dominant Plant Species | Stratum | Indicator Status |
|--------------------------------|---------|------------------|
| 1. <i>Echinochloa muricata</i> | Herb | OBL |
| 2. <i>Iva annua</i> | Herb | FAC |
| 3. <i>Leersia oryzoides</i> | Herb | OBL |
| 4. <i>Lespedeza cuneata</i> | Herb | None |
| 5. <i>Panicum virgatum</i> | Herb | FAC+ |

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:

Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Racoon silt loam (Typic Endoaqualf)

On Jackson County hydric soils list? Yes: X No:

Is the soil a histosol? Yes: No: X

Histic epipedon present? Yes: No: X

Redox Concentrations? Yes: X No: Color: 7.5YR 5/6 and 10YR 5/6

Redox Depletions? Yes: No: X Color: N/A

Matrix color: 10YR 4/2 and 5/2 over 5/2 and 6/2

Other indicators: None.

Hydric soils? Yes: X No:

Rationale: This soil possesses redox concentrations within a low chroma matrix, which indicates saturated or reduced conditions for extended duration. Therefore, the soil at this site meets the hydric soil criterion. This soil meets NRCS hydric soil indicator F3 – Depleted matrix.

ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 2 of 5)

Field Investigators: Wiesbrook and Busemeyer **Date:** August 19, 2004
Project Name: FAP 322 (US 51) **Section No.:** 2B-3
State: Illinois **County:** Jackson **Applicant:** IDOT Dist. 9
Area Name: Wet meadow
Legal Description: SW/4, SW/4, SW/4, Section 33, T. 8 S., R. 1 W
Location: This wetland occupies nearly the entire mitigation monitoring site.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: N/A

Depth to saturated soil: >0.66 m (26 in)

Overview of hydrological flow through the system: This area is hydrologically influenced by overflow from the Big Muddy River, sheet flow from surrounding uplands, and precipitation. Water leaves the area via evapotranspiration, groundwater recharge, and some surface drainage to the east.

Size of watershed: <1.3 km² (0.5 mi²) for the surrounding area; 277 km² (107 mi²) for the Big Muddy River at Murphysboro

Other field evidence observed: ISGS estimated 5.4 ac (2.2 ha) of this area met the wetland hydrology criteria (Fucciolo et al., 2003). This year, a drier than average year, only 1.2 ha (2.9 ac) satisfied the wetland hydrology criteria (Fucciolo, et al 2004). We observed water-stained leaves, algal surface, and wetland drainage patterns.

Wetland hydrology: Yes: X No:

Rationale: Field evidence cited above and ISGS data indicate that at least a portion of this area is inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion.

DETERMINATION AND RATIONALE:

Is the area a wetland? Yes: X No:

Rationale: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all present at this area; therefore, we determined that this area is a wetland.

ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 3 of 5)

Field Investigators: Wiesbrook and Busemeyer Date: August 19, 2004
 Project Name: FAP 322 (US 51) Section No.: 2B-3
 State: Illinois County: Jackson Applicant: IDOT Dist. 9
 Area Name: Wet meadow
 Legal Description: SW/4, SW/4, SW/4, Section 33, T. 8 S., R. 1 W
 Location: This wetland occupies nearly the entire mitigation monitoring site.

SPECIES LIST

| Scientific name | Common name | Stratum | Wetland indicator status | Coefficient of conservatism |
|----------------------------------|---------------------------|------------|--------------------------|-----------------------------|
| + <i>Acer negundo</i> | box elder | shrub | FACW- | 1 |
| <i>Acer rubrum</i> | red maple | tree | FAC | 5 |
| + <i>Agrostis alba</i> | red top | herb | FACW | 0 |
| <i>Alisma plantago-aquatica</i> | broad-leaf water-plantain | herb | OBL | 2 |
| + <i>Amaranthus tuberculatus</i> | tall waterhemp | herb | OBL | 1 |
| + <i>Ambrosia artemisiifolia</i> | common ragweed | herb | FACU | 0 |
| + <i>Ambrosia trifida</i> | giant ragweed | herb | FAC+ | 0 |
| <i>Ammannia coccinea</i> | long-leaved ammannia | herb | OBL | 5 |
| <i>Apocynum cannabinum</i> | dogbane | herb | FAC | 2 |
| <i>Asclepias incarnata</i> | swamp milkweed | herb | OBL | 4 |
| + <i>Asclepias syriaca</i> | common milkweed | herb | UPL | 0 |
| <i>Aster ontarionis</i> | Ontario aster | herb | FAC | 4 |
| + <i>Aster pilosus</i> | hairy aster | herb | FACU+ | 0 |
| <i>Aster simplex</i> | panicled aster | herb | FACW | 3 |
| + <i>Bidens aristosa</i> | swamp marigold | herb | FACW | 1 |
| + <i>Bidens frondosa</i> | common beggar-ticks | herb | FACW | 1 |
| <i>Boltonia asteroides</i> | false aster | herb | FACW | 5 |
| <i>Campsis radicans</i> | trumpet creeper | shrub | FAC | 2 |
| <i>Carex grayi</i> | bur sedge | herb | FACW+ | 6 |
| <i>Carex scoparia</i> | broom sedge | herb | FACW | 5 |
| <i>Carex typhina</i> | sedge | herb | OBL | 6 |
| <i>Carya illinoensis</i> | pecan | shrub (pn) | - | 6 |
| + <i>Cassia fasciculata</i> | partridge pea | herb | FACU- | 1 |
| <i>Celtis occidentalis</i> | hackberry | shrub | FAC- | 3 |
| <i>Cephalanthus occidentalis</i> | buttonbush | shrub | OBL | 4 |
| <i>Chasmanthium latifolium</i> | sea oats | herb | FACW | 4 |
| + <i>Conyza canadensis</i> | horseweed | herb | FAC- | 0 |
| + <i>Cyperus strigosus</i> | long scaled nut sedge | herb | FACW | 0 |
| <i>Desmanthus illinoensis</i> | Illinois bundle flower | herb | FAC- | 4 |
| <i>Desmodium paniculatum</i> | panicled tick trefoil | herb | FACU | 2 |
| + <i>Echinochloa muricata</i> | barnyard grass | herb | OBL | 0 |
| <i>Eclipta prostrata</i> | yerba de tajo | herb | FACW | 2 |
| <i>Eleocharis obtusa</i> | blunt spike rush | herb | OBL | 2 |
| <i>Elymus virginicus</i> | Virginia wild rye | herb | FACW- | 4 |
| <i>Eupatorium coelestinum</i> | blue boneset | herb | FAC+ | 3 |
| + <i>Eupatorium serotinum</i> | late boneset | herb | FAC+ | 1 |
| <i>Fraxinus pennsylvanica</i> | green ash | shrub (pn) | FACW | 2 |

Species list continued on next page.

ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 4 of 5)

Field Investigators: Wiesbrook and Busemeyer **Date:** August 19, 2004
Project Name: FAP 322 (US 51) **Section No.:** 2B-3
State: Illinois **County:** Jackson **Applicant:** IDOT Dist. 9
Area Name: Wet meadow
Legal Description: SW/4, SW/4, SW/4, Section 33, T. 8 S., R. 1 W
Location: This wetland occupies nearly the entire mitigation monitoring site.

SPECIES LIST (cont.)

| Scientific name | Common name | Stratum | Wetland indicator status | Coefficient of conservatism |
|---------------------------------------|----------------------------|------------|--------------------------|-----------------------------|
| <i>Gleditsia triacanthos</i> | honey locust | shrub | FAC | 2 |
| <i>Hibiscus laevis</i> | halberd-leaved rose mallow | herb | OBL | 4 |
| <i>Hypericum punctatum</i> | spotted St. Johns-wort | herb | FAC+ | 3 |
| + <i>Ipomoea hederacea</i> | ivy-leaved morning glory | herb | FAC | * |
| + <i>Ipomoea lacunosa</i> | small white morning-glory | herb | FACW | 1 |
| + <i>Iva annua</i> | marsh elder | herb | FAC | 0 |
| + <i>Juncus tenuis</i> | path rush | herb | FAC | 0 |
| <i>Leersia oryzoides</i> | rice cutgrass | herb | OBL | 3 |
| <i>Leersia virginica</i> | white grass | herb | FACW | 4 |
| + <i>Lespedeza cuneata</i> | sericea lespedeza | herb | NI | * |
| <i>Liquidambar styraciflua</i> | sweet gum | shrub (pn) | FACW | 6 |
| <i>Lobelia cardinalis</i> | cardinal-flower | herb | OBL | 6 |
| <i>Lobelia inflata</i> | Indian tobacco | herb | FACU- | 4 |
| <i>Ludwigia alternifolia</i> | seedbox | herb | OBL | 5 |
| <i>Ludwigia peploides glabrescens</i> | creeping primrose willow | herb | OBL | 5 |
| <i>Ludwigia polycarpa</i> | false loosestrife | herb | OBL | 5 |
| <i>Lycopus virginicus</i> | bugle weed | herb | OBL | 5 |
| <i>Mimulus alatus</i> | winged monkey flower | herb | OBL | 6 |
| + <i>Morus alba</i> | white mulberry | herb | FAC | * |
| + <i>Panicum dichotomiflorum</i> | fall panicum | herb | FACW- | 0 |
| <i>Panicum virgatum</i> | prairie switchgrass | herb | FAC+ | 4 |
| <i>Penthorum sedoides</i> | ditch stonecrop | herb | OBL | 2 |
| + <i>Phyla lanceolata</i> | fog-fruit | herb | OBL | 1 |
| <i>Platanus occidentalis</i> | sycamore | shrub(pn) | FACW | 3 |
| + <i>Polygonum lapathifolium</i> | pale smartweed | herb | FACW+ | 0 |
| + <i>Polygonum pensylvanicum</i> | giant smartweed | herb | FACW+ | 1 |
| <i>Polygonum punctatum</i> | dotted smartweed | herb | OBL | 3 |
| <i>Populus deltoides</i> | eastern cottonwood | herb | FAC+ | 2 |
| + <i>Prunella vulgaris</i> | self-heal | herb | FAC | * |
| <i>Quercus palustris</i> | pin oak | shrub (pn) | FACW | 4 |
| <i>Rotala ramosior</i> | tooth-cup | herb | OBL | 4 |
| + <i>Rumex crispus</i> | curly dock | herb | FAC+ | * |
| <i>Salix nigra</i> | black willow | shrub | OBL | 3 |
| + <i>Sida spinosa</i> | prickly sida | herb | FACU | * |
| + <i>Solanum carolinense</i> | horse-nettle | herb | FACU- | 0 |

Species list continued on next page.

ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 5 of 5)

Field Investigators: Wiesbrook and Busemeyer Date: August 19, 2004
 Project Name: FAP 322 (US 51) Section No.: 2B-3
 State: Illinois County: Jackson Applicant: IDOT Dist. 9
 Area Name: Wet meadow
 Legal Description: SW/4, SW/4, SW/4, Section 33, T. 8 S., R. 1 W
 Location: This wetland occupies nearly the entire mitigation monitoring site.

SPECIES LIST (cont.)

| Scientific name | Common name | Stratum | Wetland indicator status | Coefficient of conservatism |
|---------------------------------|--------------------|---------|--------------------------|-----------------------------|
| <i>Spermacoce glabra</i> | smooth buttonweed | herb | FACW+ | 4 |
| + <i>Toxicodendron radicans</i> | poison ivy | shrub | FAC+ | 1 |
| <i>Ulmus americana</i> | American elm | shrub | FACW- | 5 |
| + <i>Viola pratincola</i> | common blue violet | herb | FAC | 1 |
| <i>Vitis cinerea</i> | winter grape | vine | FACW- | 4 |
| + <i>Xanthium strumarium</i> | cockle bur | herb | FAC | 0 |

† Coefficient of Conservatism (Taft et al. 1997) + weedy native or non-native species, (p) planted species, (pn) both planted and naturally occurring species, *non-native species

$$FQI = \sum C/N = 192/72 = 2.67 \quad \bar{C} = \sum C/N = 192/72 = 2.7$$

Planted Shrubs (that are not also naturally occurring)

SPECIES LIST

| Scientific name | Common name | Stratum | Wetland indicator status | Coefficient of conservatism |
|------------------------|-----------------|---------|--------------------------|-----------------------------|
| <i>Betula nigra</i> | river birch | shrub | FACW | 4 |
| <i>Quercus bicolor</i> | swamp white oak | shrub | FACW+ | 7 |
| <i>Quercus lyrata</i> | overcup oak | shrub | OBL | 7 |

$$*FQI = \sum C/N = 210/75 = 2.8 \quad * \bar{C} = \sum C/N = 210/75 = 2.8$$

*These calculations include the complete species list above, as well as the planted trees.

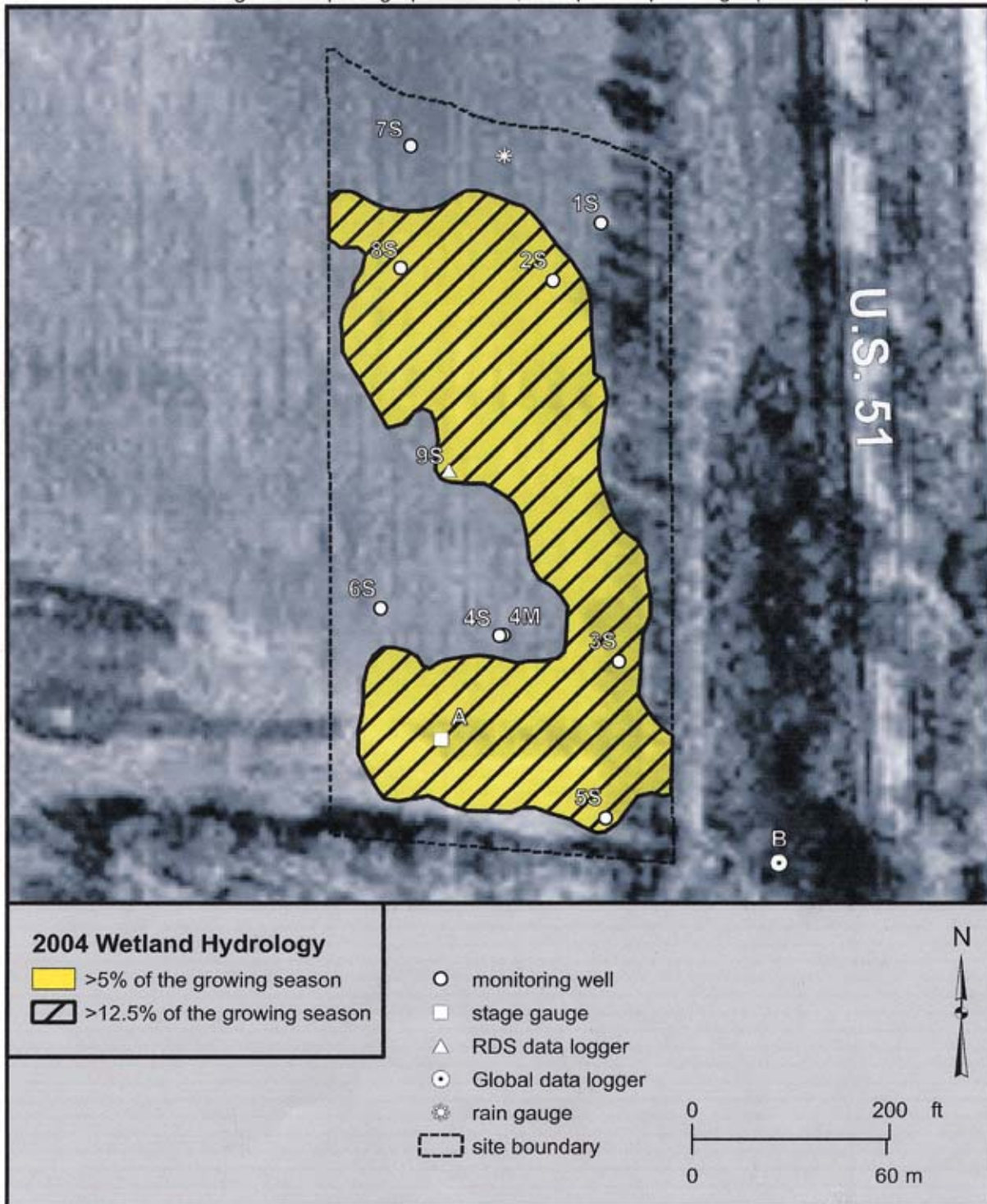
Determined by: Scott Wiesbrook (soils and hydrology)
 Dan Busemeyer (vegetation and hydrology)
 Illinois Natural History Survey
 607 East Peabody Drive
 Champaign, Illinois 61820
 (217) 265-0368 (Wiesbrook)

Figure 1.

De Soto Wetland Compensation Site (FAP 322)

Estimated Areal Extent of 2004 Wetland Hydrology

map produced by rectifying IDOT as-built plans and ISGS topography
to USGS digital orthophotograph De Soto, NW quarter quadrangle (ISGS 2003)





Picture 1A. Facing north from photostation 1.



Picture 1B. Facing northwest from photostation 1.



Picture 1C. Facing west from photostation 1.



Picture 2A. Facing northeast from photostation 2.



Picture 3A. Facing southwest from photostation 3.



Picture 4A. Facing east from photostation 4.



Picture 4B. Facing southeast from photostation 4.



Picture 4C. Facing south from photostation 4.